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**Effect of hydrodynamic conditions on the efficacy of aldehyde-based biocides
against *P. FLUORESCENS* biofilms**

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The effectiveness of glutaraldehyde (GTA) and ortho-phthalaldehyde (OPA) to control biofilms formed by *Pseudomonas fluorescens* on stainless steel slides under laminar and turbulent flow, using a flow cell reactor, was compared. The action of the biocides was assessed in terms of the respiratory activity of the biofilm and biofilm mass removal. The physical stability of the biofilm after biocide treatment was also evaluated through a rotating device. In order to compare the action of both biocides in suspended and sessile bacteria, the activity of the biocides against bacterial suspended cultures was also assessed. The interference of proteins on the action of the biocides was also investigated since these components of the biofilm matrix may react with the biocides, decreasing their action.

The turbulent *P. fluorescens* biofilm seems to be more difficult to inactivate than the laminar biofilms, having OPA a strong disinfectant ability than GTA. Concerning biofilm removal, both biocides appear to have poor effect independently of the flow regime under which biofilms are formed. As expected, the toxic action of the biocides was more pronounced in suspended bacteria than in biofilms. This toxic action was significantly reduced when bovine serum albumin (BSA) was added to the suspended cultures, emphasized that these aldehyde biocides react strongly with proteins. The physical stability of the biofilm was differently conditioned by biocide application: OPA increases the biofilm removal regardless the concentration tested; on the contrary, GTA promotes biofilm strengthening, since the amount of biomass that remains attached to the surface, after submission to the different shear stresses, increase with GTA application. The experimental methodology used in this work revealed to be valuable in biofilm related studies.